

UNIT VI: FACTORS INFLUENCING PERFORMANCE AND SURVIVABILITY

This unit focuses on self-protection and the protection of other road users. It emphasizes safety belts as the most effective means to prevent traffic injuries and fatalities. It also addresses factors that influence driver or vehicle capabilities, ultimately affecting the quality of driver performance. The effects of alcohol are emphasized. Drugs, fatigue and emotions also are addressed. The unit concludes with a review of basic maintenance checks that can reduce the risk of vehicle failure.

INSTRUCTIONAL OBJECTIVES

Knowledge Objectives

Students will know:

Safety Restraints

1. The benefits and effectiveness of restraints
2. The factors relating to dynamics of a crash, especially the concept of the second (human) collision
3. Why restraints are effective
4. Facts that counter arguments against safety belt use
5. They have responsibility for protecting occupants in their vehicles.

Alcohol

1. How the body processes alcohol
2. That alcohol adversely affects the brain and, consequently, the SIPDE process
3. The factors and relationship among factors leading to blood alcohol concentration (BAC)
4. That behavior becomes more affected as BAC increases
5. OWI is a problem, and youth are overinvolved in drinking/driving crashes
6. The major factors which make youth different in the OWI crash pattern
7. Which, and at what BAC level, abilities are adversely effected by alcohol
8. The types of errors made by drinking drivers
9. The legal penalties of OWI
10. How to calculate BAC levels
11. At least 2 methods people may use to limit drinking before driving and to separate drinking from driving
12. Alternatives people may follow to avoid drinking and driving
13. How to recognize signs of overdrinking in others
14. At least one method for intervening in the drinking and drinking/driving of others.

Other Drugs

1. General types of drugs and how they affect human performance

2. The importance of following dosage instructions for prescribed and over-the-counter drugs
3. The kinds of impairment resulting from drugs and the importance of avoiding driving when impaired by drugs
4. The danger of combining alcohol with any other type of drug
5. To avoid driving if alcohol and drugs are combined
6. There are legal penalties for driving under the influence of controlled dangerous substances.

Fatigue

1. Drivers perform more poorly when fatigued
2. At least two measures to follow to avoid fatigue when driving will be necessary
3. At least two ways to prevent fatigue when driving
4. They should not continue to drive if fatigue sets in
5. Signs of fatigue in others as evidenced by driver's behavior and performance.

Emotions

1. General types of emotions and how they may be expressed
2. Their emotions may affect driving abilities and driver performance
3. That emotions can be compensated for or controlled before and during driving

Vehicle Performance Factors

1. Drivers are responsible for maintaining their vehicles in safe operating condition
2. How, and how often, to make basic vehicle maintenance checks.

Belief Objectives

Students will accept that:

1. Wearing safety restraints is the single most important thing an occupant can do to protect against injury
2. All occupants should wear safety restraints
3. They can take steps to maximize their safety
4. They have a responsibility--moral and legal--to protect other road users
5. They can be affected by alcohol, fatigue, drugs and emotions
6. They are personally responsible for their driving behavior and accidents when they occur because of impairment by alcohol, fatigue, drugs or emotions
7. They can be a significant force in keeping others from drinking and driving.

Content in areas of Fatigue, Emotions and Vehicle factors may be effectively communicated through presentation. Presentation of crash dynamics (in safety restraint section) can be facilitated through use of film or video stressing the rapidity with which the "human collision" occurs and the power of crash forces generated in relatively low-speed crashes.

Group discussion examining the validity of myths inhibiting belt use are considered essential to achieving belief objections. Similarly, group discussion of key alcohol myths (e.g., "people relax and drive better after a drink or two," "some people can drink a lot and not be affected," "coffee, exercise and fresh air will sober you up," "you can't get drunk on beer") are deemed essential to attainment of attitudinal objectives.

The concept of peer intervention to help friends impaired by alcohol or other drugs may also benefit from discussion of what intervention techniques appear most practical, and what makes students reluctant to employ them.

If time allows, students may be involved in role-playing exercises that give them a chance to practice—and get comfortable with using—intervention techniques. Students can be divided into three groups, each group assigned (as home study) to develop a true-to-life scenario with one stage of intervention (before drinking, during drinking, after drinking). Groups can play out the scenarios in class, each scenario followed by a critique from other students of the effectiveness of the intervention techniques displayed and optional techniques not used.

Sections from the Iowa Driver Manual appropriate for home study include "Operating While Intoxicated or Drugged" (from section 2), "Equipment" (from section 3), and "Alcohol and Drugs" and "Other Drugs" (from section 5).

INTRODUCTION

No one is at 100% all the time. But drivers need to know about the physical and mental factors that have the greatest detriment on their safe-driving performance. Additionally, since drivers may be in accidents even when they are performing safely (e.g., a drunk driver or a driver suffering a heart attack suddenly veers across the center lane into oncoming traffic), they need to know what they can do to improve their chances of surviving a crash.

SAFETY RESTRAINTS

Using occupant restraints is the single most important thing anyone can do to improve the chances of surviving a crash.

Types of Restraints

Safety Belts

The most common type of restraint is safety belts:

- The lap belt (found in the rear seats) is the most basic restraint.
- The combination lap-shoulder belt, as found in front seats, provides greater protection.

The major disadvantage of either belt system is that, to provide the protection they are capable of, occupants must do something: adjust them properly and buckle them.

Automatic Restraint Systems

To get around this disadvantage, automotive engineers have developed automatic restraint systems that work without any help from the occupant.

Automatic Lap/Shoulder Belt System

- Automatically locks itself into place over the driver and the right front seat passenger when doors are closed.
- Major limitation of this system is that it does not automatically provide protection to those in the back seat.

Air Bags

- Stored in steering column and dash on the passenger side.
- When the front bumper hits something (usually at speeds above 5 mph), bags inflate, then rapidly deflate, leaving driver with clear view.
- The major disadvantages:
 - They provide protection only in head-on crashes, not when the vehicle is hit from the side or rear
 - They provide protection only for the initial impact. This leaves occupants unprotected if a second crash occurs--e.g., if the car bounces off of one vehicle and into another. In some, air bags offer an additional measure of protection to occupants, but they are not a substitute for seat belt use.

Child Safety Seats

A special type of safety restraint are child safety seats.

- Iowa law requires drivers to have all children under the age of 3 fastened in an approved car safety seat.
- Children between the ages of 3 and 6 must be secured in either a safety seat or in seat belts.
- Safety seats are essential for small children because regular safety belts do not fit small children properly. Hence, regular safety belts can produce internal injuries to small children.

Car safety seats should be used for anyone weighing less than 40 lbs. or under 40 inches tall.

- Children over these sizes are too big to be protected properly by the safety seats and should be secured in safety belts.
- In a lap/shoulder combination belt, the shoulder strap should be placed behind the children until they are tall enough that the shoulder strap will lie across the collar bone, and not across the neck.

What Happens In A Crash

To appreciate the importance of wearing safety belts, people must know what happens in a crash. The most important thing to remember is that, in any given accident, at least two collisions take place:

- The first is the vehicle collision -- The car hits something; crushes up, and then stops.
- The second, more important collision is the "human collision"--the crash of the people in the car that occurs after the first collision.

The human collision is the one that hurts people and the one against which safety belts provide protection.

Crash Dynamics

An example of how the two collisions occur within one accident: A car smashes head on into a solid wall at 30 mph.

- Bumper stops as soon as it hits wall, but rest of car keeps going forward
- Forward motion mashes up the front end of the car. The crumpling helps soak up the force of the crash so the rest of the car can stop.
- All this happens fast. About 1/10 of a second passes between the time the bumper hits the wall and the time the car comes to a complete stop.
- During that tenth of a second, an unbelted occupant is still traveling at 30 mph inside the car. It takes the occupant about 1/50 of a second before hitting some part of the car--e.g., a windshield or steering wheel. That's the human collision.
- The entire accident--from the moment the car hits to the moment the driver hits--is over in .12 seconds.

Crash Forces

The forces involved in these crashes are tremendous:

- At 30 mph, a person is thrown with the same force as if they had jumped off a 3-story building.
- No one's arms are anywhere near strong enough to catch him or herself and "break" that kind of fall. But safety belts are.

How Safety Belts Work

Belts work in several ways to protect occupants in a crash.

1. They start stopping a person sooner.

- Belts are part of the car, so they start losing speed as soon as the car does.
- The occupants body slams against the belt and begins to slow down with the car ("ride down").
- By stopping earlier, the occupants body has a longer time in which to spread out the crash forces.

2. Its expand a bit when a body slams into them.

- Slight though the expansion is, it serves the same purpose as the crunching of the fender (absorbs some of the crash energy).
- These little "edges"--a few milliseconds of extra stopping time, a few millimeters of expansion--don't sound like much, but in a crash where action is so powerful and over with so quickly, they represent a big percentage of what's available and can make a very big difference in the outcome.

3. Belts channel the force of a crash.

- Belts distribute the crash forces to the strongest parts of the body -- the hip bones (lap belt) and rib cage (shoulder strap)
- By spreading out the crash force over a larger part of the body, belts ease the pressure on any one vital part.

4. Its help control what hits occupants and what they hit.

- In a crash, everything in car moves toward the point of impact:
- If hit from the side, occupants and objects will be thrsideways toward crash point.
- If hit from front, occupants thrown forward toward the hood and anything in between (steering wheel, shift lever, windshield, dash, etc.)
- If hit from rear, occupants thrown back against the seat, then snap forward (like coming off a diving board) straight for the hood.
- Belts don't keep occupants from moving toward the crash but belts assure that occupant will collide with the belt, not with hard dangerous objects like glass or window frames.

5. Belts keep the "human collision" from becoming a collision between two humans.

- Two unbelted occupants will often smash into each other in a crash, simply because they are both going to the same location--the point of impact.
- The results can be disastrous. At 30 mph, a person's body will hit with the force of several thousand pounds--enough force to severely injure and even kill.

Belts and Accident Prevention

Belts Can Prevent Accidents.

Belts keep drivers behind the wheel--where they need to be to control the vehicle.

- Unbelted drivers can be torn away from the wheel by taking a turn too fast or hitting a pothole and bouncing up.
 - If thrown far enough away from the wheel by these events, the driver could lose control and crash.
- The emergency turn maneuver, for example, is very difficult to complete if driver is unbelted.
- The first half circle turn in an emergency left turn can throw the driver so far right that it is physically impossible to make a full 360° turn in the opposite direction.

Keep Control In Accidents

Not all crashes are "one shot deals":

- Often a car will hit one vehicle, bounce off, hit another, and bounce again.
- Drivers not wearing belts run a much bigger risk of being knocked out or pulled from behind the wheel as soon as they hit the first car.
- If that happens, they are in no position to do anything to avoid hitting something else.
- Belts help drivers stay behind the wheel after the first crash, giving them a chance to control the car and avoid second and third collisions.

Effectiveness Of Belts

Each year, traffic crashes injure about 2 million people and kill another 45 thousand. Studies indicate that belt use could cut the number of serious injuries received by half and could reduce fatalities by 60-70%. Wearing lap belts alone cuts chances of being killed in a crash by half.

- Unbelted drivers are 3-4 times more likely to be killed than drivers wearing a lap/shoulder belt combination.

- Canadian Air Force study found belts were effective at speeds of up to 600 mph.
- At 25 mph or 75 mph, occupants much more likely to survive a crash if they are wearing belts.
- The slower the speeds involved in a crash, the greater the chances of survival-- belted or not. This is because crash forces increase with speed.

1. 30 mph crashes are often fatal to unbelted occupants; belted occupants almost guaranteed to survive in crashes below 30 mph.

2. At high speeds (55 mph and even more) belts are about the only way occupants have fighting chance to survive.

Young Drivers at Risk

Though all drivers should use belts, young drivers need them more than others.

- The reason for this is that young drivers have the highest crash rate and the highest traffic fatality rate of any age group.
- The crash rate is so high because of inexperience and overinvolvement with excess speed and drinking/driving accidents.
- The other common element of teenage accidents is failure to use belts.

Myths Inhibiting Belt Use

Though evidence of safety belt effectiveness is irrefutable, too many people still do not buckle up. The "reasons" belt non-users give for their actions are illogical and, often, downright wrong. "Reasons" commonly offered include:

- Belts will trap occupants in car
- Belts cause internal injuries
- Belts are uncomfortable and make it harder to drive
- Belts aren't needed for short trips
- It's better to be thrown clear of the car
- If people don't want to wear belts, that's their business
- Asking someone to buckle up will insult them or make them nervous

Trapped In Car

Some people fear their car will go off the road and that a belt would trap them inside, leaving them vulnerable to a fiery explosion (ruptured gas tank) or a drowning (car will sink in water).

- Though television shows make it appear that most accidents result in fiery explosions or watery graves, such crashes seldom occur in real life.
- Indeed, fire and water problems occur in less than one of every 200 accidents.

Even if a driver is involved in such accidents, they'll be much better off if belted in.

- The belt will cut their chances of being knocked unconscious or otherwise being disabled early in the accident.
- People will have a harder time getting out of a car if they are unconscious or maimed than they will have with pushing a button and removing a safety belt in a split second.

Internal Injuries

When properly fastened and adjusted (e.g., lap belt across hips rather than over stomach) belts will not cause internal injuries.

- In a high speed crash, belts may leave bruises over the hip bone. But such a minor injury is far better than what would have occurred if no belt had been worn.
- Studies in Australia showed a sharp drop in spinal, chest, skull and facial injuries after a mandatory belt law was passed. Most people would prefer a bruised hip to a fractured skull.

Belts Uncomfortable

Seatbelts help people sit up straight. Because of this, backs won't tire and start to ache so quickly. In this way, belts make driving more comfortable.

- Since shoulder belts move with the driver, they give all the freedom of movement a person needs in driving.
- Belts make it easier to drive because they keep drivers behind the wheel--where they must be. That's one reason race car drivers always wear belts.

Short Trips

People who argue that belts aren't needed on short trips imply either that accidents don't happen on short trips or that the speeds involved are so low that no one would be hurt anyway. Both implications are wrong.

- Three out of four fatal accidents occur on short trips within 25 miles of home.
- More than half of all accidents in which someone is hurt occur at low speed (under 40 mph).
- A crash at speeds as low as 12 mph can kill--about the speed driven in a shopping center parking lot.

Better Thrown Clear

Being "thrown clear" sounds like a good idea, but it's not. The key word isn't "clear." It's "thrown."

- When an unbelted occupant is "thrown" in a crash, the impact with the windshield (as they leave the car) or a tree, curb or pavement (as they land) may well kill them. Even if it doesn't, they can be hit by a car while lying dazed or unconscious on the road.
- Studies show that people are 25 times more likely to be killed or seriously injured when "thrown clear" than when they stay inside the car.
- showed that 4 of every 5 people killed by being thrown out of the car would have lived if they had stayed inside.

Nobody's Business

Every time drivers "mind their own business" by not wearing a belt, they'll increase their chance of losing control of the car. That increased risk makes the belt decision the business of everyone sharing the road with that driver.

- Also, since belts can keep people from crashing into each other, the unbelted occupant poses a hazard to everyone else in the vehicle.
- When someone is killed or hurt because of not wearing safety belts, family and friends suffer economically (hospital bills, insurance rates, etc.) and emotionally.

- Even total strangers have a stake in cutting accident costs, because everyone shares the burden of higher medical insurance, welfare expenses, rehabilitation training and worker compensation costs arising from needless injuries and deaths.
- Traffic crashes cost more than 44 billion dollars last year. If more people wore belts, billions could be saved--for everyone.

Insulting/Nerve Racking

Buckling up doesn't show a lack of confidence in someone's ability to drive. It just shows a healthy respect for reality--the fact that anyone can be in a crash on any given trip.

- Using belts actually shows respect for others, because it shows you're interested in protected them from hazards created by unbuckled occupants (bodies crashing together).
- Next to no one is "scared" by a request to buckle up. But studies show that 9 of 10 people do buckle up when asked. The request is viewed as evidence of concern for their safety, not as a threat to their safety.
- Asking others to use belts is an act of enlightened self-interest. It protects all occupants from each other in event of a crash.
- It also helps reduce the consequences of a crash--not only financial burdens, but also the guilt and remorse associated with having a friend or family member hurt because someone was "too shy" to ask them to buckle.

ALCOHOL

Drinking and driving is a serious problem.

- Drinking drivers were involved in more than 25 thousand traffic deaths last year--about 3 people an hour.
- Young drivers are especially susceptible to risks engendered by drinking and driving. Of all those killed in drinking/driving accidents, over a third are under 25 years old.
- In fact, drinking and driving is the leading cause of death for people age 15-24.
- Another 200 thousand young people are disfigured, maimed or otherwise horribly injured each year because of drinking and driving.

How Alcohol Works

To understand why alcohol degrades driver performance, people must understand how alcohol works.

Alcohol Absorption

Alcohol is different from anything else people eat or drink. When it gets in the stomach and small intestine, it's absorbed directly into the blood stream. It does not need to be digested first.

Alcohol Distribution

- Once in the bloodstream, alcohol is carried throughout the body --fast. On an empty stomach, alcohol starts reaching the brain less than 5 minutes after the first swallow.

- Once there, it enters the brain cells and keeps them from working normally. As soon as that happens, alcohol affects how people think and act.
 - Some parts of the brain are more resistant to the effects of alcohol than others. As the level of alcohol builds up in an individual (as drinks are consumed more rapidly than the alcohol can be eliminated from the system) it progressively affects all parts of the brain, further deteriorating the performance of those brain parts that are most susceptible to alcohol while at the same time starting to affect other, more resistant parts.
1. The part of the brain affected first is the higher learning center--the part that controls judgment and inhibitions.
 2. As alcohol levels rise, the part of the brain that controls vision, coordination and muscle control is affected.
 3. The last part of the brain affected is the "core area" that controls vital functions. When alcohol reaches this level, a person will pass out (the brain is entirely sedated), leaving only the automatic functions of breathing and heartbeat.
 4. Even these automatic functions can be shut down with higher levels of alcohol--resulting in death from an overdose of alcohol.

Alcohol Elimination

Alcohol levels decrease when the body is able to eliminate alcohol faster than alcohol is being fed into the system.

- Alcohol is eliminated almost entirely (90%) through oxidation.
- Oxidation occurs in the liver, where the alcohol is burnt into harmless byproducts.
- The average liver is large enough to burn up about 1 drink an hour.

Whenever the drinking and absorption rate exceeds the rate of elimination (1 drink per hour), alcohol will build up in the bloodstream and all body organs. When alcohol builds up high enough, the drinker becomes drunk.

During the "sobering up" process (i.e., when alcohol is being eliminated faster than it is being taken into the system) the effects of alcohol dissipate in reverse order:

- When people who has been staggering (because alcohol has built up sufficiently to impair balance and muscle control) recovers to the point that they are able to walk steadily, this does not mean they are stone sober.
- Other faculties affected earlier--judgment and inhibitions, for example--will still be impaired.

What Determines BAC

Doctors--and the police--measure how severely an individual is impaired by alcohol by measuring the concentration of alcohol in the system. Blood alcohol concentration (BAC) depends on three factors:

- the amount of alcohol consumed,
- how long the person has been drinking
- how much the drinker weighs.

Number of Drinks [Visual 23 (A Drink is a Drink) may be used here.]

The amount of alcohol consumed is a function of the number of drinks the person has imbibed. Beer, wine and liquor all have different concentrations of alcohol. But a typical "drink"--be it a can of beer, a glass of wine or a shot of liquor--contains six-tenths of an ounce of alcohol.

- Beer contains approximately 5% alcohol. A 12 oz. can of beer, then, contains .6 oz. of alcohol (12 oz. X 5% alcohol = .6 oz. alcohol)
- Most wines contain about 12% alcohol. A 5 oz. glass of wine, then, contains .6 oz. of alcohol (5 oz. X 12% alcohol)
- A shot of liquor is about 1.5 oz. The blood alcohol concentration in liquor is indicated by the "proof" number. The proof number is twice the blood alcohol concentration. Thus 80 proof whiskey is 40% alcohol. A shot of 80% liquor contains .6 oz. of alcohol (1.5 oz. X 40% alcohol)

People who drink "non-standard" drinks--such as 16 oz. cans of beer or "doubles"--are ingesting more than one drink's worth of alcohol per drink.

Number of Hours

The number of hours a person drinks affects BAC because the only way to eliminate alcohol from the system is to oxidize it. Since the average liver can burn only one drink's worth of alcohol an hour, having more than one drink an hour causes BAC to rise.

- If someone takes no more than one drink (.6 oz. of alcohol) an hour, that person's BAC will never exceed the 1-drink level, no matter how long the person continues to drink.
- If the same person takes 2 drinks an hour, alcohol will build up.
- At the end of the first hour, one drink will have been burned off, but the other will remain in the system.
- If 2 more drinks are taken in the next hour, one of them will be burned off and one will remain, leaving 2 drinks in the system.

Number in System

To figure out how many drinks are in the system, a person can simply count the number of drinks consumed and subtract the number of hours since the person started drinking. For example, someone who has consumed 6 drinks in 3 hours will have approximately 3 drinks left in the system.

- There is nothing a person can do to speed up the oxidation rate.
- Drinking coffee or taking showers has no effect on the rate at which the liver works. At best, these "quick fixes" will help a drunk stay awake and clean.
- Only time (for the liver to do its job) will lower the BAC.

Weight

The number of drinks minus the number of hours spent drinking determines how much alcohol is in a person's system. This amount, and a person's weight determines BAC.

The rule governing weight and BAC is: the bigger the body, the lower the BAC for given amounts of alcohol.

- In general, a smaller person, drinking the same amount and at the same rate as a bigger person, will have a higher BAC.

- The major reason for this is that bigger people have more blood and other body fluids with which to "dilute" the alcohol. (The bigger the container, the greater the capacity.) Example: a 140 pounder with 3 drinks in the system will have an BAC of .06%; a 100 pounder will reach the same BAC with only 2 drinks in the system.

BAC Rule of Thumb

The "average" person (approximately 130 lbs.) will have an BAC of .02% for each drink in the system.

- Four drinks would bring BAC to .08%.
- Lighter persons would reach this level with 3 or fewer drinks.
- Heavier persons would reach this level with 5 or 6 drinks in the system.

Other Factors

Emotions, expectations and physical condition also can play a role in determining how alcohol will effect the individual at any given time:

- Anger, jealousy or other emotions can all quicken or intensify the effects of alcohol.
- So can a lack of drinking experience. Inexperienced drinkers often anticipate how drinks will affect them.

--Expect to feel a little light headed, a little silly, maybe a little reckless.

--Often this expectation becomes a self-fulfilling prophecy--one or two drinks feels like 4, 5 or more.

- Because alcohol is a depressant drug, it will magnify any physical fatigue present. This can make the drinker exceptionally drowsy.

Alcohol and Driver Performance [Visual 24 (BAC/Driver Condition) may be used here.]

Because safe driving is, essentially, a mental process, alcohol's effect on the brain translates to effects on driver performance.

- After only one drink, a driver will be slightly affected.
- With 2 or 3 drinks in the system, a driver will begin to "feel" the effects of alcohol. His driving will feel it too.
- With 4 to 6 drinks in the system, a driver will be legally drunk (.10% BAC), and his chances of having an accident will be greatly increased.

Alcohol and Judgment

The first faculty affected--judgment--is critical to all driving situations.

1. Drivers must constantly be able to judge: speed (theirs and others), and space (room to merge, turn or stop).

- Often, drivers will say that a drink relaxes them and helps them drive better.
- They are not more relaxed, their system is more depressed.
- They only think they are driving better because their judgment is impaired.
- Because of their poor judgment, they cannot assess their driving performance accurately.

2. Alcohol's affect on judgment is progressive: the more alcohol in the system, the more quickly judgment is affected and the more severely it is affected.

3. Poor judgment is accompanied by a false sense of security (alcohol's effect on inhibitions).

- This can lead drivers to take more risks than they normally would.
- This is especially dangerous for young drivers since studies show they are more apt to take risks than older drivers to begin with.
- Alcohol's effect on judgment may lead drivers to start taking curves a little faster, following a little closer, or trying to pass with a little less room.

Alcohol and Reaction Time

While judgment is affected with only one drink in the system, reaction time, and fine muscle control will be affected shortly thereafter. All people's reactions slow and fine muscle control begins to be impaired by the time there are 3 drinks in the system.

- In this condition, the muscles will take longer to obey the messages sent by the brain, and they will have more difficulty executing those messages (actions) properly.
- They may also start slowing for a turn a little too late or steering for a curve a little too late.
- Their driving performance will be noticeably affected.

Alcohol and Vision

People with about 5 drinks in their system will start having trouble seeing well (in addition to having problems with judgment and reactions).

- They may not be seeing double (yet). But they will have trouble focusing their eyes to have a really clear picture of what's on or near the roads.
- They will have an especially hard time seeing clearly if it's dark: night vision's the first visual function affected by alcohol.

Alcohol and Muscle Control

With about 6 drinks in the system, muscle control is messed up, along with balance and coordination.

- At this point, the effect on driving is obvious.
- Erratic speeds, quick stops, sudden lane changes, weaving--all are typical of drivers at this stage of intoxication.

Alcohol and Crash Risks

Study after study shows that as a driver's BAC increases, so do the chances of an accident.

- Young drivers are more at risk than others, because they are more likely to have an accident at lower BAC levels than older drivers.

--At BAC of .03%, drivers in the 20-25 age group are 3 times more likely to have an accident than the general driving population

--At same (.03%) BAC drivers aged 16-20 are 9 times more likely to be involved in a crash.

--Put another way, with only 1 or 2 drinks in their system, young drivers are half again as likely to have a crash as other drivers at the legal level of intoxication (.10% BAC).

- Young driver's susceptibility to crashes at relatively low BAC levels is one reason they are involved in twice as many fatal alcohol related crashes as older drivers (the other key factors are that they tend to crash at higher speeds, without being in seat-belts).
- One study found that over half of the young drivers involved in alcohol related crashes had BAC's of .02% or less. Only 20% of the young drivers had BAC's of .10% or above.
- One reason so many crashes occur at low BAC levels is that newly acquired skills are affected earlier and more severely than more established functions, such as the ability to walk. Because many safe driving performances are not yet "routine" for less experienced (younger) drivers, alcohol very quickly interferes with their ability to drive safely.

Alcohol and the Law

Because alcohol plays such a major role in traffic fatalities and injuries, drinking and driving is treated as a very serious offense. In fact it is a criminal offense.

- Persons convicted of OWI can be sent to jail for 48 hours for the first offense, a week for a second conviction. They also may be fined \$300 to \$1,000.
- People stopped for drinking and driving who refuse to take the breath test for BAC can have their licenses revoked for eight months on the first offense.
- For a second offense, these drivers will lose their licenses for one and a half years.
- Drivers who take the breath test and fail can lose their license for anywhere to 6 months to a year, depending on the record.

Underage Drinking/Driving

Because drinking itself is illegal for anyone under 21 years old, and because any amount of drinking drastically increases the crash risks for young people, anyone caught drinking and driving under the age of 21 will:

- Lose their license for a full year or until they reach age 18--whichever is longest.
- Before these drivers can reclaim their licenses, they must present proof of insurance. The typical insurance rate for young people convicted of OWI is \$3,500 to \$5,000 each year.
- Insurance rates will stay in that range for at least 3 years, even if the driver maintains a perfect record throughout that period.

Reducing Alcohol Crash Risks

The best way for drivers to reduce alcohol crash risks is to not drink at all. The best way for passengers to reduce their risks is to avoid riding with drivers who have been drinking. After all, that's the whole idea behind the drinking age law.

If young people are going to break the drinking age law, however, they should do it in such a way that it will not increase their alcohol crash risks. To avoid the risks of drinking/driving, people must separate drinking from driving. This can be done in one of two ways:

- Select the right driver -- Make sure that the only person taking the wheel is one who has not been drinking

- Provide a cushion of time -- Allow enough time after drinking stops but before driving begins to allow the liver to eliminate all alcohol from the system.

Techniques to Separate Drinking from Driving

1. Select/use non-drinking driver.

- Don't drive to party, and decline requests to drive once have started drinking.
- Ride with non-drinker.
- Ride with drinker who agrees not to drink that night (designated driver). Make sure driver sticks to agreement.

2. Limit distance to drinking location.

- If possible, keep within walking distance.
- In any event, the shorter the distance, the better (less exposure on road).

3. Separate drinking from driving with time.

- Reserve first part of party for responsible drinking.
- Leave remainder for sobering up.

4. Recognize when too impaired to drive.

- Many people have a "signal" that tells them when they have had too much--e.g., may feel warm, giggly, excited, tired.
- If can "feel" drink at all, judgment is significantly impaired.

5. Delay departure when impaired.

- Stay put until have not "felt" drinks for about an hour.
- Get involved in other, non-drinking activity so won't be tempted to drink during delay.

6. Ride with others when impaired.

- Leave car behind. (can pick up next day.)
- Make sure driver is not impaired, either.

7. If impaired and no sober driver available, don't go. Stay overnight and go home in the morning.

Alcohol Myths

Many people are reluctant to use these separation techniques because they don't understand how alcohol affects their bodies and their driving. Instead they believe in myths.

Sobering Up

Some people mistakenly believe they can speed up the "sobering up" process. Frequently recommended "remedies" include:

- drinking coffee,
- taking cold showers,
- walking to get fresh air,
- doing exercises.

None of these remedies works, because none of them have any bearing on how fast the liver can burn off the alcohol. Exercising may cause a person to breathe more heavily and sweat more freely, slightly increasing the amount of alcohol that is discharged through these avenues. However, since only a small fraction of alcohol can be eliminated this way, such activities will not measurably hasten a decrease in BAC.

Immunity

Others think that some people can drink a lot and not be affected. No one is immune to the effects of alcohol.

- Experienced drinkers may hide the effects better, because they have learned that alcohol will affect them.

--To mask these effects, they will move more slowly (e.g., to reduce the risk of knocking over another lamp).

--But reacting more slowly to events on the road only increases risks.

- Sometimes people will not feel the effects of alcohol as quickly as they normally would. For example, a person who is very excited about something, may not feel the affect of the depressant (relaxation, drowsiness) until 1 or 2 drinks later. However, just because a person doesn't feel the physical effects of alcohol does not mean they are not there.

Food in Stomach

Other people feel that if they fill their stomach with food or coat the stomach lining with milk before drinking, they won't get drunk.

- These practices will slow the speed with which alcohol can pass from the stomach into the bloodstream, but it will not stop the alcohol from getting into the bloodstream. Eventually, all the alcohol will pass into the bloodstream.
- Consequently, the effect of drinking on a full stomach is to stretch out the amount of time over which drinks "hit" the drinker. BAC's will rise and keep rising for a longer period of time after drinking has stopped. In this situation, the drinker's BAC may peak when the drinker is on the road.

Limiting Drinking

If will drink and drive:

1. Set a limit on how much will drink, and
2. Stick to the limit.

The Difficulty With Limits

- Because judgment affected by first drink, is temptation to stretch the limit once it's reached ("I feel fine; one more won't hurt.")
- By the time can actually "feel" the drinks, are way over a reasonable limit.

Setting Limits [Visual 25 (Alcohol Table) may be used here.]

Limits must be set before drinking begins.

- Estimate how long will be drinking and, based on weight, figure how many drinks can have during that period without sending BAC over .03%.
- For most people, this means no more than one drink per hour.
- Larger people may stretch it to one drink every 45-50 minutes.

Teenagers must remember that sticking to these limits does not mean they will be safe to drive

- Will still be more than twice as likely to crash as if sober.
- Will still be more likely to crash than older drivers who are over the legal OWI limit

Techniques for Sticking to Limit

1. Know What They're Drinking

- Limits set for "regulation" drink of .6 oz. alcohol
- If drinking "tallboys" or from an 18-oz. mug, count each as more than one drink.
- If drinking liquor, measure booze with a shot glass (1.5 oz.).

--Don't "eye-ball" it. (May end up pouring double or more.)

--Don't let someone else mix the drink (No way of knowing how much they put in).

- Drink wine from glass (5 oz serving), not from bottle.

2. Space the drinks so will remain at or below limit at all times.

- If plan to be at party for four hours and have set a four-drink limit, don't have all four drinks in one hour.
- If drink too fast early, impaired judgment will encourage drinker to ignore limit.
- If have drunk "too slow" early on, don't try to catch-up at end of party--will put driver on road as BAC hits peak.

3. Drink at own pace.

- Don't try to "keep up" with others.
- Avoid drinking games; their real purpose is to get people drunk fast.

4. Put drinks down, and do something other than drink.

- When drink is constantly in hand, is tempting to sip it constantly.
- Dance, eat, play (non-drinking) games--anything that keeps people active and their minds and hands off drinks. (Prevents nervous or bored sipping that can take people over their limits.)

5. Taper off early.

- Mix drinks a little weaker, or switch to non-alcoholic drinks as the party wears on.
- This gives body time to lower BAC (by elimination) before drinker gets behind the wheel.

Intervention in Others' Drinking/Driving

When in a drinking situation, teenagers can help others reduce their risks of involvement in alcohol-related crash. Can intervene successfully, whether have been drinking or not.

Why Intervene

Impaired person needs help

- Can't drive safely in that condition
- Doesn't realize can't drive safely because judgment impaired.
- Doesn't appreciate risks involved in attempting to drive:
 - Crash risks
 - Arrest (OWI) risks
 - Family sanctions (e.g., grounding) if shows up drunk.

If doesn't intervene, and crash, arrest or family sanctions occur, person who could have helped but didn't will feel guilty.

Principles of Effective Intervention

1. Can intervene at three stages:

- Before drinking begins (planning)
- During drinking
- After drinking, but before driving begins.

2. Intervention is easier, and more likely to succeed, the earlier action is taken (before drinkers get out of hand)

3. Intervene to control as many factors as possible--amount of alcohol available, rate of consumption, proximity of drinking to driving.

4. Have alternatives to address problems. If first effort fails, don't give up. Take another tack.

5. Don't need to "go it alone."

- Usually others will be concerned about the same situation.
- Enlist their help in intervening (build peer pressure).
- Just don't be afraid to be the one to raise the topic or make the first move. (Someone has to be first.)

Intervention Techniques

To intervene successfully, people must learn to recognize clues indicating the potential for unsafe drinking/driving situations and respond appropriately to diffuse the problems.

Before Drinking

Clues to look for:

- Too much alcohol--Talking about getting a keg for 20 people or having everyone chip in \$5 for booze.
- No planned activities--No one talking about dancing, non-drinking games, etc. Only apparent purpose is to get bombed.
- Bad Location--Will be held in middle of nowhere, leaving long drive back. Or held where impossible to do anything other than drink.
- Too many drivers--Most everyone attending will drive solo or with only one other person. Means greater number of potential drunk drivers and smaller pool of "spare" sober drivers to draw upon.
- Wrong drivers. Drinkers will be driving non-drinkers, rather than vice versa.
- Known Problems. Class drunk, the "walking liquor store," or someone who always starts drinking games will be there.

Intervention Actions:

- Select appropriate drivers--Make sure non-drinking drivers use their cars. Place drinkers as passengers. If not enough non-drinkers, get agreement not to drink from designated drivers.
- Limit alcohol supply--Suggest trim back on supplies/contribution amount. Suggest use some of money for non-alcohol purposes (snacks, mixers, etc.)
- Arrange non-drinking activities--Make sure someone will bring music, games, etc.
- Suggest alternative location--One closer to home, with enough room to allow non-drinking activities.

During Drinking

Clues to look for:

- Too much alcohol--e.g., someone brought an "extra" case.
- Wrong people drinking--Non-drinker or designated driver starts drinking.
- Uncontrolled rate or amount--Someone starts drinking game. Drinking from non-regulation containers, bottle. Not using shot glass to measure liquor. Someone starts drinking more, faster as end of party approaches.
- Nothing but drinking--No other activity going on.
- Suspicious behavior--Someone always has drink in hand or stays close to liquor supply, makes frequent trips outside (for "supplies"), acts out of character (shy person becomes gregarious, outgoing person becomes withdrawn), moodiness, talks unusually fast, slow or loud, tongue-tied, spills drinks, knocks things over, unsteady.
- Suspicious appearance--pale, flushed, sweaty.
- Unknowns--Stranger drops in (can't tell if out of character or not. Person arrives with drink in hand (don't know how much has already drunk).

Intervention Actions:

- Limit Amount--Suggest extra cash be returned to car (save for "next time"). Offer to serve as bartender (mix drinks properly).
- Control rate--Try to divert drinker's attention to other activities. Start dancing, games, talking about something that interests the drinker. If that fails, communicate concern: mention risks and try to persuade the drinker to stop drinking or at least slow down.
- Arrange alternate transportation--Try to get drinker to agree that will let someone else do driving. (Have the drinker hand over keys now, if possible)
- Get help--Communicate concern to others. Get their agreement to help intervene.

After Drinking, Before Driving

The same clues of appearance and behavior cited "during drinking" are clues to a driver in trouble. At this stage, intervention options are limited:

- Try to persuade to stay put or let someone else drive
 - less likely to succeed than earlier
 - drinker may feel "curfew pressure" as well as suffer from poor judgment, may be belligerent.
 - best chance to succeed if group tries to persuade.
- Prevent drinker from driving--Disable car (e.g., let air out of two tires). Take keys and hide them.
- Threaten to call parents, police if insists on driving.
 - If necessary, do it (remember crash risks).
 - Don't give up.

OTHER DRUGS

A drug is any substance taken by a person in hopes of achieving a better mental or physical state.

- Most people are multiple drug users
- Drugs frequently used and often combined include caffeine (coffee), nicotine (tobacco) and alcohol.

Virtually any drug can affect the mental or physical skills necessary for safe driving. Drivers need to be aware of the effects of drugs and the risks drug use can create.

Sources of Drugs

Prescription Drugs

- May be purchased only with doctor's approval.
- Directions (dosage amount and frequency) must be followed exactly to (1) accomplish medical purpose and (2) limit dangerous, undesirable side effects.

Over-the-Counter Drugs

- May be purchased without doctor's prescription.
- Generally less potent than prescription drugs (e.g., cough and cold syrups, lozenges tablets).
- Though weaker, not harmless.
- By law, must provide adequate directions for use.
- Read label carefully for both directions and warnings about driving.

Illegal Drugs

- Most dangerous source of drug because no quality control.
- User cannot be sure of potency--wide variation between buys.
- User cannot be sure of content--may be completely different drug from what advertised; may be cut with second drug or even poisonous substance.

Drug Effects

Drugs produce two effects:

1. wanted (desired) effects
2. unwanted effects (side effects)

Most drugs act on the central nervous system:

1. stimulants speed it up
2. depressants slow it down
3. hallucinogens affect nervous system and the way the user sees things.

Common Types of Drugs

Stimulants

1. Amphetamines:

- Speed up nervous system ("uppers")
- Often used to fight drowsiness ("pep pills")
- Make user feel more alert, self-confident
- When effect wears off, user may suddenly feel exhausted, depressed.

2. Cocaine:

- A stimulant
- In small doses, user feels joy, delight, happiness
- Moderate doses may induce violent stimulation, hallucination.

Depressants

1. Tranquilizers:

- Slow down nervous system ("downers")
- Used to deal with nervous, emotional problems.
- Cause drowsiness--especially when first taken

2. Barbiturates

- Slow down nervous system
- Used to calm nervousness
- When wear off, depression often follows

3. Narcotics:

- Depress the central nervous system
- Examples--morphine, opium, heroin
- Side effects vary widely--incoherency, dizziness, nausea, vomiting

Hallucinogens

1. Marijuana:

- A mild hallucinogen
- Effects vary widely (can act as stimulant or depressant)
- Often produces drowsiness, difficulty in judging time and space, fascination with (concentration on) one object.

2. PCP, LSD, Peyote:

- Strong hallucinogens
- Affect nervous system variously
- Change mood, behavior, perceptions

Synergistic Effects

Combining drugs can produce extremely strange and strong results.

Combining one depressant (e.g., quaalude) with another (e.g., beer) can yield effect greater than the total effect of each taken separately. Example:

- One lude may effect a person like three beers
- If that person washes down the lude with a beer, the combination may "hit" with the effect of seven or even 10 beers, not "just" four (3 + 1) beers.

This "new math" effect, created by mixing drugs, is known as synergistic effect.

Drugs Effects on Driving

Amphetamines

- Increase willingness to take risks (because of false feeling of alertness, self-confidence).
- Often used to keep awake, can keep driver from realizing how tired driver really is.
- If wear off while on the road, driver can nod off before realizing it.

Tranquilizers

- Can induce sleepiness, decrease alertness.
- Impair seeing, coordination, reaction time.

Barbiturates

- Can make thinking difficult, affect emotions, cause drowsiness.
- May reduce alertness, attention, judgment, reaction time for hours.

Hallucinogens (marijuana)

- Alters attention, vision, perception of time.
- Slows reactions, can affect mood.

Guidelines for Drug Use

1. Avoid excessive drug use. Don't take drugs unless you need them. Don't take except for medical purposes.
2. Avoid illegal drugs.
3. Read the label--for both prescription and over-the-counter drugs.
4. Ask if it will affect driving. If doctor or pharmacist doesn't volunteer the information, ask them.
5. Avoid taking others' drugs. Prescription drugs should be taken only by the person for which they are prescribed.

FATIGUE

Drivers perform best when well rested.

When tired, drivers find decisions harder to make so they make them more slowly. They also get upset more easily.

Avoiding Fatigue on Long Trips

Fatigue can often become a major factor in driver performance on long trips. To reduce the risk of fatigue on long trips, drivers should plan their trips so as to:

- Maintain their normal schedule. They should not try to drive during times when they would normally be sleeping. The body has its own internal clock which starts to "shut down the system" when the normal sleeping period arises.
- Break up the trip. On extended journeys, drivers should schedule frequent rest stops--one for each two or three of behind-the-wheel. Drivers should also be sure to make all planned rest stops even if they have made unscheduled stops in the interval.

- Have a companion. The best companion is one who can share the driving duties, alternating driving every 2 or 3 hours. But a non-driving companion is better than going it alone.

Warnings of Fatigue

Both driver and passenger should be alert to clues that fatigue is beginning to set in. These clues include:

- Boredom
- Sleepiness
- Vehicle drifting
- Staring (no eye movement)
- Slow response to other's actions or remarks
- Irritation
- Poor concentration.

Coping Techniques

When any of these clues appear, the best thing to do is get some rest. Drivers will be better off pulling off the road and sleeping in the car, than trying to continue on and ending up in a crash.

However, if it is impossible to rest, the driver can do some things to help fight fatigue:

- Shock with cold. In cold weather, open the vents or roll down the window. In warm weather, turn on the air conditioner. Warmth exacerbates a feeling of drowsiness.
- Get involved with activities. Engaging in a conversation or singing along with the radio will force the driver to be a little more alert.
- Start commentary driving. The best option, because it keeps driver's mind on driving.

EMOTIONS

Emotions can have a major effect on driver performance.

Emotions that can affect performance: worry, excitement, fear, anger, depression.

Emotions and Driving

Major problem is preoccupation.

- If worried or excited about something, may not pay attention to driving task. Driver may not notice emergency situation developing.
- If angry or elated, tendency to take needless risks increases. Driver may try to "get back" at other driver, forgetting that scaring or intimidating others reduces his margin of safety as well.
- If depressed, may accept unreasonable risks because "just doesn't care."

Controlling Emotions

Emotions are hard to control. Some guidelines:

- If angry or excited, take time to cool off. Take a walk or run. Scream. But stay off road until calm down.
- If worried or depressed, try to take mind off the problem. Listen to the radio. Listen to someone else's problems.
- If impatient, give extra time. Leave a few minutes early to reduce temptation to speed, run lights or stop signs, etc.

VEHICLE MAINTENANCE

A poorly maintained vehicle is an impaired vehicle. Just as impaired drivers are at greater risk of accident, so are impaired vehicles. It is the driver's responsibility to assure that his or her vehicle is maintained in safe operating condition.

Legal Requirements

Iowa law establishes certain "performance standards" for vehicles.

Lights

- Vehicles must have two working headlights (one on right side, one on left), and one back red light.
- The red (brake) lights must be visible for at least 500 feet.
- The law also requires a white light to illuminate the rear license plate.

Tires

- All tires must have tread that is at least 1/32 inch deep (the Lincoln penny test).
- Motorists may also be ticketed for driving without appropriate tires (snow tires, radials or chains) in snow. The tread on regular tires is not deep enough and properly designed to provide adequate traction to drive in snow.

Catch-all

The "operating an unsafe vehicle" law is a catch-all regulation to assure adequate vehicle performance.

- It can be applied to any number of vehicle equipment problems--misaligned headlights (that fail to give driver a good view of the road or blind oncoming traffic even at a low setting), faulty exhaust systems (which may leak carbon monoxide into the vehicle, as well as create a noise nuisance), etc.
- Faulty equipment can also lead to tickets if they contribute to an accident. For example, if faulty brakes contribute to a crash, the driver can be ticketed for "operating an unsafe vehicle" as well as "failure to stop."

Equipment Checks

Drivers can help assure optimal performance from their vehicles by making regular equipment checks.

Every Trip

Checks that should be made every time a driver gets in the car include:

- Windows and windshields -- Check for scratches and cracks (they interfere with vision and may cause glass to explode from impact with any object).
- Brakes -- Check pedal pressure (when fully applied, pedal should stay well above the floor). Listen for scraping or squealing noises when stopping (indicates brake lining needs replacement). Be alert to car pulling to the side when brakes applied.
- Steering -- If steering wheel moves 2 inches without changing the car's direction, it has too much play.
- Exhaust -- Listen for loud noise or rattles.
- Engine -- Be alert to signs of less power (lugging), or hard starting. (Indicates need for tune-up).

Every Tankful

Other checks should be made whenever the driver is stopping to fill up with gas:

- Headlights, brake lights and turn signals -- Check for burned out bulbs and dirty lenses (lenses should also be cleaned after have been driving on wet or muddy roads).
- Windows and windshields -- Check to make sure all glass is cleaned, inside and out.
- Tires -- Check air pressure to assure proper inflation (should be at maximum psi indicated on tires).
- Engine -- Gas mileage shouldn't be allowed to drop more than 2 miles per gallon. If it does, it may indicate need for tune-up.

Other Regular Checks

Other checks that drivers can easily make:

- Exhaust -- Look for signs of rust or holes in the muffler and tailpipe before and after the winter season.
- Suspension -- Drivers should be alert to the car bouncing too much or trouble in controlling the car. (Car not holding the road well on turns). To check suspension, push down hard on the front and rear of the car. If the car bounces more than twice before stopping, new shocks are in order.

Additionally, drivers should have their cars inspected by professional mechanics every six months.